

## AMERICAN MEDICAL INTELLIGENCER.

Vol. III.

February 1, 1840.

No. 21.

ART. I.—ON THE SOUNDS OF RESPIRATION AND OF THE VOICE.<sup>1</sup>BY PEYTON BLAKISTON, M. D.,<sup>2</sup>

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*Respiration.*—On applying the ear to the neck and chest of a person in health, certain sounds are heard during respiration, which vary with the region in which they are listened to.

In the trachea, a coarse hollow sound is heard during inspiration and expiration, (tracheal respiration.)

At the upper part of the inter-scapular region, the sound during expiration is less intense than that during inspiration, and both are softer and weaker than in the trachea, (bronchial respiration.)

At the remaining parts of the chest, the sound during expiration is scarcely perceptible, being in most cases reduced to a short puff; while the sound of inspiration is much softer and weaker than at the inter-scapular region (vesicular respiration.)

This description of vesicular respiration differs from that of Laennec, who remarks, "en entend pendant l'inspiration et l'expiration un murmure très légère, mais extrêmement distinct, qui indique la pénétration de l'air dans le tissu pulmonaire, et son *expulsion*;" thus failing to observe the disproportion between the duration of the sounds of inspiration and expiration. Those persons who are in the daily habit of practising auscultation of the chest, will, however, I think, confirm the accuracy of the description here given.

I shall now endeavour to ascertain the manner in which these sounds are produced, and the causes of the variations in quality, intensity, and comparative duration, observed at different parts of the apparatus in which they are engendered.

This apparatus consists of a tube commencing at the mouth, divided and subdivided until it terminates in the air cells. During inspiration air is passed into it by the weight of the atmosphere, and is expelled during expiration by muscular reaction, and the resilience of the air cells and of the cartilages of the ribs. In thus passing and repassing through these tubes, the air meets with obstacles at every point where their direction is changed. Now when a current of air meets with opposing obstacles, as the wind blowing upon trees, or into a tube inclined at an angle to its direction, it is thrown into sonorous vibration, and therefore noise must be produced in the trachea and its division during respiration. This sound is not sufficiently intense to be heard until the listener places his ear in contact with the

<sup>1</sup> Read before the British Association for the Advancement of Science, Aug. 27, 1839.

<sup>2</sup> Lond. Med. Gaz. Oct. 12, 1839, p. 78.

trachea; in the same manner as the noise produced by a gentle blowing on a sheet of paper is not heard until the ear be placed on the paper.

The coarse hollow sound, then, heard in the trachea, is produced by the whole air of respiration passing and repassing through this tube, and its upward and downward continuations.

At the upper part of the inter-scapular region many circumstances concur to render the sound weaker and softer than that heard in the trachea. This tube has now been divided into at least two branches, one for each lung, and hence only half of the air which enters the trachea can pass through each division; and therefore the sound generated in either of them by the friction of the air becomes proportionably weaker: and as regards the sounds similarly generated above and below this point, and respectively carried up to it by the current of inspiration and expiration, those produced in the mouth, fauces, and trachea, are weakened by divergence, and those produced in the bronchial tubes are those of one lung only, whereas the sounds generated in both lungs were carried through the trachea. Besides this, the bronchial tubes are not in actual contact with the walls of the chest, even in this spot, but are separated from them by more or less of the spongy tissue of the lungs, which, being a non-homogeneous substance, and consequently a very indifferent conductor of sound, deadens and weakens the respiratory sounds in their passage from the tubes to the ear of the auscultator. I stated that the sound during expiration was less intense in this region than that during inspiration. This arises from the additional force given to the latter sound by the vesicular respiration of the intervening portion of lung just mentioned, the sound of which is chiefly confined to the time of inspiration.

When at length the ear is placed on the remaining portions of the chest, it is no longer approximated to the *sides* of the bronchial tubes, but to their vesicular *extremities*. These are so numerous (being not only spread over the periphery of the chest, but also forming the greater part of its internal substance) that only a very minute portion of the air of respiration can reach them at any one spot, and hence very little noise can be produced in them by friction; while the sound generated in the larger tubes, although confined from total divergence in the air, is amazingly weakened and softened by the extent of surface over which it is thus spread. The sounds previously heard at the sides of the bronchial tubes are here effectually prevented from reaching the ear by the great intervening mass of spongy lung. All these causes combining to weaken the respiratory sound, the maximum intensity of which in the trachea can only be heard when the ear is brought into contact with its side, it would not be surprising were no sound detected during respiration at the surface of the chest. Another force, however, is in action. As the wind bears upon it sounds which from their great distance would be otherwise inaudible, so does the current of air during inspiration carry up to the ear those sounds which are engendered in its passage, while that during expiration acts in a contrary direction: hence the sound of inspiration is distinctly heard at the surface of the chest, while that of expiration is barely perceptible.

I shall now endeavour to ascertain *where* the sound of *vesicular respiration* is produced. Sound must be generated in every part of the trachea and its divisions during respiration, but it does not follow that every portion of it should be sufficiently intense to reach the ear of the auscultator at the surface of the chest. I cannot deny that a fraction of that which is heard in vesicular respiration may be produced by the friction of air against the interior of the vesicles, or by that of one vesicle against another, or by that of the pulmonary on the costal pleura, because a slight sound is heard at the commencement of expiration when the force of resistance is at its maximum; but I contend that the *principal* part of it is not thus produced; otherwise, taking place immediately under the ear, and therefore unaffected by the direction of the current of air, it would be heard as distinctly during

expiration as inspiration; nor on the other hand can it be principally formed in the mouth and fauces, otherwise it would be much strengthened by stertorous breathing, which is not found to be the case. The sonorous waves formed in these parts, in passing through tubes, the calibre of which rapidly diminishes, and the direction of which is constantly changing, would seem to be in a great measure broken and destroyed before they reach the vesicles. We seem, then, to have arrived, *par la voie d'exclusion*, at the bronchial tubes, as the parts in which the sound heard in vesicular respiration is principally generated; and this conclusion derives some confirmation from the fact that sibilous and sonorous râles, which are undoubtedly formed in these tubes, modify, and in some cases, totally mask the sounds of vesicular respiration.

When in certain diseases a portion of the lung becomes converted into a solid mass, vesicular respiration is replaced over the spot where that portion is in contact with the walls of the thorax, by bronchial respiration, as it has here been defined, coarse, with prolonged expiration. In endeavouring to account for this alteration, Laennec remarks.<sup>1</sup> "*Les raisons de la respiration bronchique me paraissent assez faciles à donner. En effet, lorsque la compression ou l'engorgement du tissu pulmonaire empêche la pénétration de l'air dans les vésicules, la respiration bronchique est la seule qui ait lieu;*" and Andral writes.<sup>2</sup> "*Elle nous paraît dépendre de ce que l'air ne peut pas pénétrer au-delà des gros tuyaux bronchiques.*" Thus both writers agree in considering the bronchial tubes, which lead to the solidified lung, as the seat of the bronchial respiration which is heard in such cases. It must be remembered, however, that the current of air in the bronchial tubes owes its existence to the expansion of their vesicular extremities, and that when their expansibility has been destroyed by the deposition of solid matter in them, that moment the current must cease in these tubes, and with it the sound of respiration within them. Were the larger tubes sufficiently elastic to keep up a current, then, in a solidification of a whole lung, we should hear loud bronchial respiration, which is not found to be the case.

Dr. Jackson, of Boston, was the first to notice prolonged expiration as a characteristic sign of bronchial respiration. He writes,<sup>3</sup> "In some commencing cases of phthisis, where the respiration is not yet truly bronchial under the clavicle, when we still hear the vesicular expansion and naught else on *inspiration*, I have discovered the bronchial sound on *expiration*. In other words, as the tubercular deposit advances, the bronchial *expiration* may be heard before the bronchial *inspiration*; it may be heard at an earlier period of the disease, and may thus become a very important sign, as making known the disease yet sooner after its origin. This circumstance is very explicable. As soon as tubercular matter is deposited, there exists a solid material around the bronchia, which will transmit the sound made by the passage of the air through these tubes; but thus early a great portion of the lung, even in the part affected (the summit), is permeable to the air, and therefore the murmur of vesicular expansion on *inspiration* entirely masks the sound of the air passing through the bronchia, which would otherwise have been transmitted through the surrounding denser medium. On expiration, however, circumstances have changed: the air, on passing through the bronchia, produces the same sound as on its entrance, and as now there is no vesicular expansion to mask it, it is easily transmitted through the diseased or condensed part to the ear of the observer." Fully acknowledging the practical value of the prolonged sound of expiration as a diagnostic sign, I cannot admit the correctness of Dr. Jackson's observation that it is heard at a period when the sound of inspiration is purely vesicular. Although it is easier to discover the presence of a sound at a time when

<sup>1</sup> Vol. i. p. 56, 3d edition. Paris.

<sup>2</sup> Vol. i. p. 432, 3d edition. Bruxelles.

<sup>3</sup> Life of Dr. Jackson, p. 129.



none was previously heard, than to detect an alteration in the quality of one previously existing, yet whenever I have perceived the sound of expiration prolonged at the surface of the chest, I have at the same time found the sound of inspiration stronger and coarser than usual; in short, I have found both sounds bronchial. Neither do I think can Dr. Jackson's explanation be considered satisfactory. We cannot understand how the strong coarse sound of bronchial respiration can be masked by the softer and weaker sound of vesicular inspiration, which has in fact been shown principally to consist of that bronchial respiration modified and weakened by divergence, and borne up to the ear by the current of air. Again, were any portion of lung to be solidified and made sufficiently homogeneous to transmit the sound of expiration, it would also transmit the coarse undiverged sound of inspiration which takes place in the same tubes.

I would submit that when bronchial respiration is heard over a solidified portion of the lung, it is caused by the passing and repassing of the air through bronchial tubes, leading to *healthy expansible vesicles*, and it is made sensible to the auscultator by his ear being brought into mediate contact with their sides by the solid lung.

*Voice.*—I shall next endeavour to discover the causes which tend to modify the sounds of the voice.

According to the researches and experiments of Professor Willis, the voice is formed in the larynx by the vibration of the vocal cords or plates when their planes are in a vertical position, being put into motion by the passage of the air from the lungs. The vocal apparatus, therefore, is a wind-instrument, consisting of a tube with membranous tongues.

It has long been noticed that *timbre*, a quality of tone of wind-instruments, depends much upon the material of which they are made. Wishing to know more upon this subject, I successively placed similarly constructed pipes of wood and of metal on the wind-chest of an organ; and I found that the tone became coarse, and buzzing, in proportion to the elasticity of the material. Having next varied the weight on the bellows, I found the coarseness of tone to increase with the force of the blast. Lastly, by making use of pipes of different degrees of thickness, but of the same material, I found that the coarseness varied inversely with the substance of the pipe. In each of these experiments the coarseness of timbre was proportionate to the degree in which the material of the pipe entered into vibration. Hence, I concluded that *the timbre of wind-instruments depends upon the proportion in which the solid vibration of their material are united with those of the air within them, in the formation of the resultant undulations*. Now we can hardly conceive two kinds of undulations thus uniting in different proportions without an effect being produced on the *form* of the resultants to which they give rise; and therefore it is rendered highly probable that each timbre has its corresponding form of wave. Leaving the further consideration of this subject for another time and place, I would merely remark that a jarring must take place between the undulations of the air, and those of the material of the tube surrounding it. For when the instrument is sounded, each section of the column of air, having a tendency to spread in all directions, will produce an outward bulge in the elastic material; in the next moment reaction will take place, and an inward bulge will be produced in the same spot; but by this time (the blast continuing) the next section of air will have been forced on to this spot, and, expanding, will tend to produce an outward bulge in the material, and must meet and receive a jar from the inward bulge just mentioned.

The correctness of the law which I have thus deduced from experiment, is further confirmed by reference to a few facts of daily observation. The upper notes of a flute, formed by small feeble aerial vibrations, are soft and sweet; the bass notes, formed by large powerful waves, which strongly affect the material of the instrument, are coarse and buzzing. The timbre of all reed-instruments partakes more or less of this character, inasmuch as

the vibrating reed communicates its motion to the solid instrument to which it is fixed, and causes it to vibrate with some force. Owing to the elasticity of their material, brass instruments give out the greatest possible coarseness of timbre. In the French horn, which is very long, this is not so much marked as in the trumpet, in which the whole column of air can be suddenly thrown into strong vibration by a quick forcible blast, and can thus be made to act powerfully on its material. A certain degree of thickness is required for a flute, in order that its tone may be sweet and clear. So when any one is desirous of imitating the tone of a brass instrument with his voice, he shapes his lips in such a manner as to make them vibrate strongly; and the moment the nose is closed, a coarse nasal twang is produced by the vibration of the nose itself, which may be felt with the finger, and which is produced by the reverberation of the aerial undulations within its cavity.

To return to the voice.

When the stethoscope is placed on the trachea of a person engaged in speaking, the voice seems to mount up the instrument, as if the speaker's mouth were placed close to the ear of the auscultator, and it has a peculiar buzzing tone, which excites a tingling sensation in his ear, (pectoriloquy.)

On placing the stethoscope at the upper part of the inter-scapular region the voice seems to issue from the spot on which it is placed, and its timbre is still coarse and buzzing, (bronchophony.)

When this instrument is placed on most other parts of the chest, no resonance or unusual quality of the voice is perceived.

It appears to me, that this alteration of the timbre of the voice in pectoriloquy and bronchophony, as compared with that which it has when heard issuing from the mouth, when the ear does not approach the neck or chest, has not been sufficiently noticed. Laennec, it is true, speaking of bronchophony, remarks, "Son timbre a quelque chose d'analogue à celui d'un porte-voix;" but the modification which the voice undergoes in passing through a speaking trumpet has very little resemblance to the buzzing timbre of bronchophony in many cases.

In the formation of the voice, as in the notes of wind-instruments, two kinds of undulation are exercised—those of the air which passes through the larynx during expiration, and those which are communicated to the trachea by the vocal plates; and, according to what has been proved in regard to wind-instruments, the timbre of the voice must depend upon the relative proportion between these two undulations.

When the stethoscope is applied to the trachea, the sounds generated within the latter have to pass through its substance before they can reach the ear of the auscultator, and are therefore conveyed to his ear much more freely through the solid material of the stethoscope, than through the column of air contained in it, inasmuch as all sounds are propagated much more freely through media of similar molecular construction to those in which they are generated, or to which they have, as in this case, been transferred, than through those which are differently constructed. In the sound, therefore, thus conveyed to the ear, the solid bear a greater proportion to the aerial vibrations than in that which reaches it in the ordinary way through the air, when the converse takes place. This accounts for the voice sounding coarser and more buzzing when heard through the stethoscope, than when heard issuing from the mouth of the speaker. Its sound, too, in the former case, is transmitted to the auscultator with an intensity undiminished by the divergence between the mouth of the speaker and the ear of the listener, which takes place in the latter case.

These undulations which enter into the formation of the voice have a tendency to spread, not only in the direction of the mouth, but also towards the periphery of the chest. Their progress, in this direction, however, is opposed by the current of air during expiration, and by the increasing mass

of spongy non-homogeneous lung. When, therefore, the voice is listened to at the upper part of the inter-scapular region, it is found to resound less than in the trachea, because the aerial vibrations have been opposed by the current of expiration between this point and the larynx, and because the spongy lung has already begun to surround the air-tubes, to interpose itself between them and the walls of the chest, thus deadening the solid vibrations of the tubes, and more or less interfering with the transmission of sound from them to the ear.

Lastly, at the surface of the chest, between which and the larynx the whole current of expiration has opposed the aerial vibrations, and where a very large mass of spongy lung surrounds the air-tubes, and is interposed between them and the ear, nearly all resonance of the voice ceases.

In certain states of disease, pectoriloquy and bronchophony are heard at parts of the chest where no resonance of the voice is perceived in health; and not only does the resonance vary in different cases, but also the timbre of the voice; in some cases sounding remarkably clear, in others very coarse and buzzing, with every shade between these two extremes. The law of timbre laid down in this paper, will, I think, account for these differences. Thus, when a tuberculous cavity exists near the surface of one of the lungs, and contains but little fluid, the resonance of the voice is strong, and its timbre clear. In this case, owing to the diminished elasticity of the lung which surrounds the cavity, the current of air is lessened, and in some cases stopped, in consequence of which the aerial undulations are propagated freely into the cavity, and are there strengthened by reflection and echo; hence they predominate over the solid vibrations, and soften the timbre of the voice, while they increase its resonance. When a cavity exists, surrounded by much solidified lung, the resonance is still great, and the timbre becomes much coarser, owing to the increased force of the solid vibrations. When the lung is solidified, without containing any cavity, the resonance is usually less than in the former case, but the coarseness of tone is much increased by the same law. Much depends on the proportion between the power of the voice and the extent of solidification. When the voice is very strong it will throw a whole solidified lung into vibration, and give rise to coarse bronchophony, but this is rare. In the case of a female with medullary sarcoma of the upper half of the right lung, there was no resonance of voice, because the main tube of the lung was filled with solid and semifluid matter, so that the vibration of the voice could not penetrate the bronchial tubes at all. The buzzing quality of the voice was most strongly marked in the case of a man in the wards of Addenbrook's Hospital, Cambridge, whose right lung was studded with lumps of chronic induration, varying in size from that of a nut to a walnut. The tingling sensation excited in the ear when it was applied to the back of the right side of his chest, during the act of speaking, was quite painful. I will not pursue this subject further, nor will I, on this occasion, enter upon the consideration of those modifications of the voice which are observed in pleuritic effusion; I am, however, engaged in making experiments on the propagation of sound through different media, the results of which will, I trust, throw some light upon this subject.

The following conclusions may, I think, be deduced:—

1. That the respiratory sound is caused by the friction of the air against the interior of the air-passages, and that it becomes softer and weaker from the mouth towards the periphery of the lungs, owing to the divergence of sound caused by the great space over which it is spread, and to the diminution in the calibre of the air-tubes.

2. That the sound of *vesicular respiration*, confined almost entirely to the time of inspiration, is *principally* generated in the bronchial tubes, and would be scarcely perceptible to the ear at the surface of the chest, were it not borne up to it by the current of air during inspiration.

3. That the coarse respiratory sound, heard both during the inspiration and expiration over a solid portion of lung, is generated in tubes leading to



healthy expansible vesicles, and is made sensible to the ear by its being brought into immediate contact with their sides by the solid lung.

4. That the timbre of wind instruments and of the vocal apparatus depends on the proportion in which the solid vibrations of the material of which they are made are united with those of the air within them, becoming coarser as the former predominate.

5. That in accordance with this law, the voice sounds coarser and buzzing through a stethoscope placed over the larynx, because its vibrations are propagated more freely to the ear through the solid material of the instrument (a similar medium) than through the air contained within it.

6. That the resonance of the voice diminishes from the larynx to the periphery of the chest, where it ceases, from its vibrations being gradually stifled by the opposing current of air during expiration, and by the increasing mass of spongy non-homogeneous lung.

7. That in certain diseases resonance of the voice is perceived at the surface of the chest, owing to the current of air being weakened or destroyed, and the conducting power of the lung increased; and that its timbre is altered in proportion as the propagation of one or other of its component vibrations is favoured or retarded by such morbid changes—the aerial undulations predominating in cavities, and giving rise to clear pectoriloquy, and the solid undulations predominating in solidification, and producing buzzing bronchophony.

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**ART. II.—DYSMENORRHŒA, ACCOMPANIED BY INFLAMMATORY CONGESTION OF THE CERVIX UTERI, EFFECTUALLY RELIEVED BY SUPERFICIAL SCARIFICATION OF THAT PART.**

*To the Editor of the Medical Gazette.*

Sir,—I am anxious to communicate the following case, and its treatment, as I have reason to believe that the scarification of the cervix uteri, in these painful cases, is nearly, if not entirely, an original suggestion, especially with regard to abstracting from it a definite quantity of blood. Dr. Ashwell saw the case with me, and was much pleased with its effects. He requested that the operation might be repeated as circumstances required.

I remain, sir, yours respectfully,

J. L. FENNER.

15, King's Row, Pentonville, Nov. 9, 1839.

Mrs. —, a widow, æt. 39, had been long afflicted with dysmenorrhœa, accompanied with inflammatory congestion of the uterus, dating its origin many years since, from a severe and protracted labour. The nervous system was so entirely implicated in this affection, that the superior and inferior extremities, as well as the body, were continually agitated by a species of chorea. She was passing through a three months' course of mercurial friction, and had found no relief from opium or any kind of narcotics. Leeches, alone, applied round the cervix uteri, had palliated her sufferings, and these acted like enchantment, dissipating every symptom, and, after restless nights, producing a calm refreshing sleep of some hours' duration.

Nov. 1, 1839.—Appreciating the relief obtained from the abstraction of blood, and its tendency to remove congestion, it struck me as quite practicable, aided by my cylindrical tubular speculum (described in the Medical Gazette, May 25, 1839, and may be seen at instrument-makers), easily to

<sup>1</sup> Lond. Med. Gaz., Nov. 29, 1839, p. 358.

abstract, by slight scarifications of the cervix uteri, any quantity I might think desirable. After a few superficial scarifications the blood trickled freely, and, in a quarter of an hour, two ounces and a half (by weight) were obtained, and the tube withdrawn, when the bleeding immediately ceased. Precisely the same relief followed, with uninterrupted sleep, as was wont to result from the application of leeches. The patient said that the operation was so painless that it would not even have disturbed her sleep. Dr. Ashwell saw the patient with me, and requested that the operation might be repeated, as it seemed to have been very beneficial.

2d.—Two ounces and a half of blood were obtained under the same circumstances.

3d.—Three ounces and a half of blood.

5th.—The cervix uteri having many marks of scarification, the tube was withdrawn a little, so as to expose the *cul de sac* of the vagina. Scarifications were made, presuming that it would bleed freely, because to that part of the vagina leeches have been applied by tubes perforated at the end with holes, and unscientifically thrust up the vagina; but such tubes cannot be duly applied to the cervix uteri, though sometimes to a portion of its side. The blood trickled freely, and in a quarter of an hour four ounces (by weight) were obtained, with the same relief as by leeches.

9th. The patient having obtained more decided relief than on any former occasion from the application of leeches, the scarification is to be resumed as occasion may require, and the mercurial friction to be continued to the given time.

I have performed this operation on two other patients, and, since writing the above, have abstracted five ounces of blood (by weight) from the cervix uteri.

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## BIBLIOGRAPHICAL NOTICES.

### *Hamilton's Introductory Lecture.*<sup>1</sup>

We know not a more thankless task than to attempt to give a history of living characters. One man—not sufficiently lauded, to his own taste, but too much so for that of every person else, considers himself condemned with faint praise. Another feels slighted for being passed over altogether, and on the whole whatever may be the honest effort of the author to please, he must expect to fail of his object. Such, we doubt not, will be the fate of Professor Hamilton, for we see nothing in his address to save him from the common lot. Inaccuracies in such an undertaking are inevitable, and some of these Professor Hamilton has fallen into. For example, after remarking that the name of the successful soldier is in the mouth of every one, he observes somewhat pleonastically:—

“But who knows that Jenner introduced the process of vaccination, and thus arrested as by a power omnipotent the ravages of a disease which swept off annually more than half a million, and bid fair to depopulate the earth? How small a niche in the temple of fame does he occupy? Who has compiled his history, or traced the results of his discoveries? Who has

<sup>1</sup> Introductory Lecture before the Surgical Class of the College of Physicians and Surgeons, Fairfield, N. Y. Delivered Dec. 3, 1839. By Frank H. Hamilton, M. D., Professor of Surgery. Published at the request of the Class. 8vo, pp. 22. Albany, 1839.



recorded the victories which his single arm has achieved, or chaunted the loud pæan when he had conquered the foe, and brought back as trophies your families—all your household gods? 'In this year Jenner introduced vaccination,' is all the biography and epitaph of the greatest benefactor of the human race!"

Surely the biography by Dr. Baron must be regarded as tribute sufficient to his merit; and if it be not, the various eulogies in different countries of the globe cannot fail to be so. Jenner is a name that can never be forgotten.

We would correct another error: the operation for hydrocele by injection was recommended by Sir James Earle, not by Mr. Henry Earle, who died only a few years ago.

We give the author's peroration as a specimen of his style, which is somewhat peculiar, at least to our taste.

"In conclusion, permit me to say, that I have held before you the names and characters of such of our distinguished surgeons as history and my own memory have preserved, with the view of presenting to you just models for your imitation, and also a proper and suitable stimulus to exertion in your most honourable profession. Surely what they attained with lesser advantages, you with equal talents and far greater advantages, should not barely attain, but incomparably exceed. That you may all successfully emulate a Jones, a Dorsey, or a Physic, is not a problem, but an axiom. The science which we contemplate, was, during their pupilage, but in its infancy; its rudiments only could be taught, and that too imperfectly; their genius and industry supplied therefore the lack of instruction. But with their accumulated observation, and the invaluable aid of careful and minute anatomical investigation, surgery has become an exact and almost demonstrative science. It is no longer theory and speculation—a wilderness in which all entering together do soon separate and wander—eternally diverging; but they who start aright, and are guided by the unerring needle, anatomical knowledge, will always keep their latitude, and go parallel.

"I beseech you, therefore, gentlemen, to make this your first business, to acquaint yourselves thoroughly with every point and particle of the human frame. As the skilful mariner knows every cape and bay, and guided by his faithful compass, safely rides amid shoals and rocks in the darkest night, when the winds and the waves are high—so should the skilful surgeon know well every bone and muscle—every nerve and artery and vein—where exactly they lie concealed beneath the even surface—what their normal and what their abnormal size and course—that he may be able securely to cut his way amid the most complicated textures, turning his steady hand, now from this, now from that, certain danger, though wholly hidden from sight by the darkness and depth of the wound, or the terrific gush of the sanguine flood.

"And such surgeons it becomes you all to be: By your license, whether received at this institution or elsewhere, you will be entitled and *required* to perform all the supposable chirurgical operations. Wherever you locate, whether in the populous and maritime cities of the east, or in the sparsely settled villages of the west, sudden casualties will give frequent occasion for the trial of your skill and courage; and if you are well grounded in anatomy, you will always find yourselves amply furnished with both: but if you are not thus grounded, I trow you will experience such an utter confusion of mind and fainting of heart, as will chill your bones and press the cold dew from your blanched brows. However much you may pride yourself upon your mechanical or inventive genius, my word for it, it will prove a false reliance when alone trusted. You may have the genius of a Fulton to invent, and of a Lefevre to construct, and yet you shall not know now to skilfully and safely open the larynx when the patient is dying from suffo-

cation—or where to tie the artery, when a soldier, deeply wounded by a bayonet thrust, is sinking from internal hemorrhage. You may understand well the cut and thrust—the manœuvres and tactics, and all the arts of war, but if you have not a chart of your enemies' country, and do not well know all the streams and mountain ridges—all the morasses—the secret passes and everglades, you will do well to lay aside your weapons, and wait quietly in your tents as *men de reserve*.

"That the requisite knowledge to become a competent surgeon is *easily* attained, I have not said; were it so, the goal would be less worthy our ambition. That it *can* be attained by you all, I have *dared* to say: Yet only by toil and watchfulness and unceasing industry. You must treasure with a miser's parsimony the hours of the day, and steal from the quiet midnight the moments allotted to sleep: while others meet in convivial circle, and enjoy the innocent pleasures of social converse, or make themselves merry and light in the wine chamber with the full goblet's cheer—you must be fast locked in the student's cell, with the musty tomes of Desault, Bell, and Cheselden, as your companions, and drink in deep draughts from these pure and exhilarating fountains of knowledge. Ease and fame lie in opposite poles, and he who desires the one must forsake the other. Here, gentlemen, on this spot, the roads diverge, and you shall choose: The *one* is wide and beaten, and as far as the eye can reach extends a smooth unbroken level. He who travels it is, with its thousand denizens, forgotten even while he lives. The *other* is steep and tortuous and rugged—still ascending, its termination is at a dizzy height, and many become faint and fall before they have measured half its altitude; but he who, by strength and perseverance, attains its summit, becomes himself a light and guide to those who follow, and stands forever like a star in the heavens, beaming clearer and brighter as each successive generation of man shall pass away."—p. 22.

#### MISCELLANEOUS NOTICES.

*National Medical Convention.*—The National Medical Convention for the Revision of the Pharmacopœia of the United States assembled in the City Hall, Washington, on the 1st of January, 1840.

The following delegates represented their respective medical societies and colleges in the convention, viz:—Theophilus C. Dunn, M. D., Rhode Island Medical Society; Lewis Condict, M. D., New Jersey Medical Society; Franklin Bache, M. D., Henry Bond, M. D., and Joseph Carson, M. D., the College of Physicians of Philadelphia; George B. Wood, M. D., University of Pennsylvania; Robley Dunglison, M. D., Jefferson Medical College; William W. Morris, M. D., and James Cowper, M. D., Delaware Medical Society; John R. W. Dunbar, M. D., John C. S. Monkur, M. D., and Edward Foreman, M. D., Washington University, Baltimore; Joshua J. Cohen, M. D., Medical and Chirurgical Faculty of Maryland; Thomas Sewall, M. D., and N. W. Worthington, M. D., Medical Society of the District of Columbia; Thomas Miller, M. D., Harvey Lindsly, M. D., and John W. Thomas, M. D., Columbian Medical College; John W. Davis, M. D., Vincennes Medical Society of Indiana; and Wm. Bacon Stevens, M. D., Georgia Medical Society.

The credentials of the delegations from the White Mountains Medical Society of Vermont, from the Medical Society of New Hampshire, from the Albany Medical College, and from the College of Physicians and Surgeons of Lexington, Kentucky, were presented by Dr. Condict, President of the Convention of 1830; but the delegates were prevented from attending. After the rising of the Convention, however, Josiah Bartlett, M. D., dele-

gate from the New Hampshire Medical Society, and Samuel G. Baker, M. D., and William A. Aikin, M. D., delegates from the University of Maryland, reached Washington, and by public notice in the papers stated their full concurrence in the measures adopted by the Convention.

The Convention elected Lewis Condict, M. D., of New Jersey, President; George B. Wood, M. D., of Philadelphia, Vice President; N. W. Worthington, M. D., of Georgetown, D. C., Secretary; and Harvey Lindsly, M. D., of Washington, Assistant Secretary.

With the view of giving the various medical interests of the country their due weight in the deliberations of the Convention, the surgeon-general of the army, and the senior naval surgeon at Washington, were invited to participate in the proceedings. After some other preliminary business, the Convention adopted the following resolution, offered by Dr. Bache.

*Resolved*, That the delegates from the different medical bodies represented in this Convention be requested to present any written communications with which they may have been charged.

Upon calling over the several delegations, it appeared that no written communication had been forwarded to the Convention, except by the College of Physicians of Philadelphia. Dr. Bache presented from this college several documents, which he stated had been prepared with great industry and care, with a view to facilitate the revision and emendation of the pharmacopœia of 1830. This communication elicited discussion; but, with a view to more definite action, Dr. Lindsly proposed the following resolution, which was adopted.

*Resolved*, That the communication from the College of Physicians of Philadelphia be referred to a committee, who shall also be instructed to report a plan by which the revision and publication of the pharmacopœia may be carried into effect.

It was resolved that the committee should consist of five members, to be named by the president; and Drs. Bache, Davis, Stevens, Cohen, and Dunn, were appointed.

Dr. Wood offered the following proposition, which was adopted.

*Resolved*, That a committee be appointed to report a plan for the organisation of the next convention for revising the pharmacopœia.

It was ordered that the committee consist of three members, to be named by the president; and Drs. Wood, Sewall, and Duglison were appointed.

The committee to whom the documents from the College of Physicians of Philadelphia were referred, and whose duty it was to arrange a plan by which the revision and publication of the pharmacopœia might be carried into effect, made the following report, which, with the accompanying resolutions, was adopted by the Convention.

"The committee are of opinion, that the labours of revision constituting the communication from the College of Physicians would form a proper basis for the new pharmacopœia; and that this communication, and all others that shall be received from bodies which have appointed delegates to this Convention, should be referred to a committee of revision and publication, to meet in Philadelphia as soon as practicable. As it is desirable that the committee here proposed should have the assistance of pharmaceutical bodies, it is recommended that authority be given to it to request the co-operation of colleges of pharmacy in the United States. A revising committee, thus constituted, and clothed with power to fill their own vacancies, to publish the work after the completion of the revision, and to take order on all incidental measures necessary to carry out the objects of the convention, would, in the opinion of this committee, form a body to which the revision and publication of the pharmacopœia might be safely trusted. To carry out these views, the committee recommend the adoption of the following resolutions by the Convention.

"1. The communication from the College of Physicians of Philadelphia, and all other communications which may be received from bodies that have appointed delegates to this Convention, shall be referred to a committee of



revision and publication, consisting of seven members, three of whom shall form a quorum.

"2. The committee, thus constituted, shall meet in Philadelphia, and be convened, as soon as practicable, by its chairman.

"3. The committee shall be authorised to request the co-operation of the colleges of pharmacy in the United States; to publish the work after the completion of the revision; and to take all other measures which they may deem necessary to carry into effect the object of the Convention.

"4. The committee shall have power to fill its own vacancies.

"5. When the committee shall have terminated their labours, they shall prepare a report of their proceedings, and transmit it to the secretary of this convention, to be laid before the next convention.

"All which is respectfully submitted.

FRANKLIN BACHE,	} Committee.
JNO. W. DAVIS,	
W. BACON STEVENS,	
JOSHUA J. COHEN,	
THEOPHILUS C. DUNN,	

*Washington, Jan. 3d, 1840."*

The Convention then proceeded to choose the members of the committee of revision and publication, proposed in the above report; and Drs. Wood, Bache, Dunglison, Cohen, Dunn, Stevens, and Sewall, were appointed.

The committee whose duty it was to arrange a plan for the organisation of the next convention for revising the pharmacopœia, made a report, which, at the suggestion of Dr. Stevens, was amended so as to make the first Monday in May, 1850, the time for the meeting of the Convention, instead of the first Monday in January, 1850. The report thus amended, and modified in other respects to suit the change, was adopted by the Convention, as follows:—

"The committee appointed to suggest a plan for organising the next convention report, that they have taken the subject into consideration, and ask leave to submit the following resolutions, which, with a few modifications, are the same as those adopted in 1830 for the organisation of the present Convention.

"1st. The president of this Convention shall, on the 1st day of May, 1849, issue a notice, requesting the several incorporated state medical societies, the incorporated medical colleges of physicians and surgeons, and the incorporated colleges of pharmacy, throughout the United States, to select a number of delegates not exceeding three, to attend a general convention to be held at Washington, on the first Monday in May, 1850.

"2d. The several incorporated bodies thus addressed shall also be requested by the president to submit the pharmacopœia to a careful revision, and to transmit the result of their labours through their delegates, or through any other channel, to the next convention.

"3d. The several medical and pharmaceutical bodies shall be further requested to transmit to the president of this Convention the names and residences of their respective delegates as soon as they shall have been appointed, a list of whom shall be published, under his authority, for the information of the medical public, in the newspapers and medical journals, in the month of February, or March, 1850.

"4th. In the event of the death, resignation, or inability to act, of the president of the Convention, these duties shall devolve on the vice president, and should the vice president also be prevented from serving, upon the secretary, or the assistant secretary, the latter acting in the event of the inability of the former.

GEO. B. WOOD.	} Committee.
THOS. SEWALL.	
ROBLEY DUNGLISON.	

*Washington, Jan. 3d, 1840."*

The following resolutions were offered by Dr. Wood, and adopted by the Convention :—

*Resolved*, 1st. That the secretary take charge of and preserve the existing records, until his successor shall be appointed by the convention of 1850, when it shall be his duty to hand them over to such successor. 2d, That, in case of the death, resignation, or inability to act, of the secretary, his duties shall devolve upon the assistant-secretary. And 3d, That it be recommended to future conventions to appoint their secretary or secretaries from members residing in the District of Columbia.

Dr. Bond offered the following resolution, which was adopted :—

*Resolved*, That the committee of revision and publication be requested to take such measures as they may deem most effective to induce physicians and apothecaries to adopt the nomenclature of the Pharmacopœia, in their prescriptions and labels.

Dr. Dunglison offered the following resolution :—

*Resolved*, That the officers of the Convention be requested to prepare forthwith for publication such part of the transactions of this Convention as may seem to them adapted for making extensively known its important objects and proceedings, and that they be authorised to publish the same in the various medical journals of the United States, and in such of the daily or other newspapers as they may think proper.

This resolution was adopted, and it was made the duty of the secretary and assistant-secretary to carry it into effect.

Having transacted business of great interest to the medical profession of this country ; having passed votes of thanks to the officers of the Convention "for the able and dignified manner in which they had discharged their respective duties," and to the Board of Aldermen of Washington, for the use of their hall, the Convention, after a session of three days, characterised by a spirit of generous cordiality which must contribute greatly to secure the objects for which they assembled, adjourned.

By order,

N. W. WORTHINGTON, SECRETARY.

HENRY LINDSLY, ASSISTANT SECRETARY.

P. S.—The medical journals throughout the United States are respectfully requested to copy the foregoing abstract of the proceedings of the Convention.

*Poisoning by Mushrooms.*—On the 1st October, 1838, M. O., the father of a family, collected some mushrooms, which he said were of a good sort, in an orchard bordering on a sheet of water near his house. They were plucked, cut into bits, and steeped in water ; they were then boiled in oil with sweet herbs, and made a large dish, which was served up at dinner at six o'clock.

M. O., the father, ate some before they came to table, and very plentifully at dinner.

M. O., the son, ate the greatest quantity next to his father.

Madame O., the mother of the family, of a weak constitution, and living very temperately, ate but few.

The grandson of M. O., aged six, ate a good many for his age.

Mademoiselle Julie, the niece of M. O., had but few ; and Rose, the cook, tasted them while stewing.

The following were the symptoms experienced by each person :—

M. O., the father, passed the night well, and went out, feeling better than ever, at six in the morning, to walk in the park. About eight he felt uncomfortable ; anxiety and nausea came on, and then vomiting of mucous and greenish substances, with bits of undigested food ; with copious half-

liquid stools, containing fragments of a spongy appearance. The vomitings were succeeded by retchings, with general weakness, coldness of the extremities, paleness of the face, burning thirst, and dryness of the throat and mouth. During the night, cramps came on in the calves of the legs and soles of the feet; the face was contracted, the limbs cold and livid; the urine was suppressed; and the pulse vanishing. From time to time there were intervals of sinking, but without drowsiness or delirium, and the patient was perfectly himself.

On the 3d, the cramps and vomitings had ceased; the liquid stools continued but were less frequent; there was less colic; no pain in the head, and but slight tendency to drowsiness. Towards the evening, during the night, and particularly on the morning of the 4th, the symptoms, which had seemed to diminish, became frightfully intense; the alvine evacuations, though less frequent, were tinged with deep black blood.

Towards 6 in the evening, the debility made rapid progress, yet the patient still preserved his recollection. In spite of the active employment of stimulants, he sank, after a death-struggle which lasted thirty or forty minutes. M. Pallois [who narrated the case], did not see him till the 2d, after the vomiting and purging had probably carried every particle of food out of the alimentary tube.

M. O., the son, was attacked on the 2d, at daybreak, with vomiting, and had copious stools with but little colic. Repose, and the use of soothing drinks, and emollient clysters, were prescribed. Under the influence of these remedies, the symptoms, which were at first attributed to mere indigestion, lost their severity; but for five days running, the patient experienced retchings, mucous stools of greenish and blood-stained tints, coldness in the limbs, tendency to swoon, and considerable thirst, with dryness of the mouth; the pulse was very weak, but regular; there was a notable diminution of the urine, and considerable agitation with slight delirium during the night. These symptoms gradually increased. On the fourth day a stool was passed, consisting of blood almost entirely pure; yet there was a remarkable mitigation of the other symptoms, with a little diaphoresis during the night.

It was not till the evening of the 6th of October that the patient could be considered as out of danger; but he was still very weak, and passed liquid stools, the colour of which, however, sensibly improved. He was not convalescent till the 8th.

During the course of his disease the symptom which harassed him the most was a want of sleep, which was not relieved by the slight narcotics given him.

Madame O. passed the night following the poisoning without feeling any inconvenience, but was severely ill afterwards. However, she experienced a fortunate reaction; the vomitings and purgings having entirely ceased. On the fourth day she was attacked with feverishness; and on the 6th of October, a bleeding from the arm to four ounces cured a dull and wearying headache.

The child, for three days, was seized with vomiting when he drank, and had watery stools of a grayish colour, without much colic; he continued weak and pale, and began to take a little light food about the fifth day after the accident.

Mademoiselle Julie had only frequent liquid stools of a grayish colour and fetid odour, with colic, nausea, and total loss of appetite: she grew pale and thin.

Rose, the cook, had several liquid stools without any bad consequence. The remains which she threw away in the evening on washing the dishes having been eaten the following morning by a young hound, he died in ten or twelve days, with vomiting, agonising pain, and convulsions. A cat in the house had the same fate.

M. Pallois having gathered mushrooms in the same place as M. O., and



being assured of their identity by persons who were present, soon saw that they were of the kind called *agaricus bulbosus* by Bulliard; *amanita viridis* by Persoon; and *agaricus phalloides* in Chevallier's Paris Flora. Their popular names are *orange* and *petite ciguë blanche*, (small white hemlock), and their poisonous action is the more terrible, as it is not felt, according to Vaillant, till twelve or fifteen hours after the mushrooms have been swallowed; an assertion which is completely verified by the preceding facts.—*Bulletin Med. du Midi*.

*Peculiarity in the Transmission of Hydrophobia.* By S. H. STEELE.<sup>1</sup>—On the 20th of May last, two ewe sheep were bitten by a dog labouring under hydrophobia. One of them had two lambs at her side, which were allowed to continue with her for a fortnight after the bites were received. She was bitten and torn considerably about the head. The other also had one lamb (a ram) with her. She received one bite only, in the neck; it was, however, a very severe one. The lamb was allowed to remain with her the same time as the others. About six weeks after the bites had been received, the first named ewe evinced the following symptoms:—she was observed often pawing and striking the other sheep like a ram—a very uncommon circumstance in a ewe; she was convulsed at intervals—she continually turned her head to her side in a convulsive manner; the bowels were very much constipated, and what little came from her was of a red colour; she refused all food. These symptoms continued, increasing in violence, for about eight days, when all hope of her recovery being abandoned, she was destroyed. A day or two afterwards, the other ewe became affected in the same manner, and the whole circumstances of the case were precisely similar to those of the former. She was killed on the seventh day. Nine or ten days after the death of the last sheep, the ram lamb was attacked in the same manner as its mother; it was, however, much more violent, butting at the other sheep, and at the hurdles, and at any thing else that came in its way; it was continually tearing the wool from its side. It expressed no uneasiness at the sight of water in a ditch, part of which was enclosed along with it by some hurdles. It was killed a week after the first appearance of the symptoms. The other lambs were attacked at the same time, and in a similar manner, as the ram, but were not so violent. They were, however, killed together, as their cases appeared equally hopeless.

The great singularity which is observable in the cases is, that *the lambs became rabid merely from sucking ewes which had been bitten by a mad dog*, for the lambs were removed from them a month before the ewes became affected. The lambs were all carefully examined, in order to discover any bite they might have received, but not the slightest scar could be discovered. The same dog bit a number of other sheep in the neighbourhood, the greater number of which died of hydrophobia. He bit a man, also, in the hand, but excision was performed, and he has hitherto done well.

No attempt was made to relieve either the ewes or the lambs.

*Ergot of Rye—its Effects on the Fœtus.*<sup>2</sup>—Mr. Proctor, in reference to the effect of ergot of rye on fœtal life, said, that a friend of his, in extensive midwifery practice in the country, had, from considerable observation, come to the conclusion that it did affect the life of the fœtus. He, Mr. Proctor, thought this conclusion to be well founded. When labour was terminated by this agent, the action was unnatural, the pain was continuous instead of intermittent, and consequently violent. He had been alarmed, in several cases, at the effect of the ergot of rye on the mother. He had seen it in one instance produce delirium and vertigo, and in another umbilical hernia. His friend in the country, to whom he had alluded, instead of taking ergot of

<sup>1</sup> Lond. Med. Gaz., Oct. 25, 1839, p. 160.

<sup>2</sup> Reports of Medical Society of London, in Lancet, Oct. 26, p. 168.

rye in his pocket when he went to a labour, had now substituted tea and sugar, and this was acting upon the safe side.

Dr. Bennett inquired in what way it was supposed the ergot acted injuriously to the infant; was it by producing apoplexy in the mother, or by acting directly on foetal life?

Mr. Statham had administered the ergot of rye in many cases, and he had come to the conclusion that it was injurious to foetal life. He had at first thought its use admissible in all cases in which the os uteri was dilated to any extent. He now never gave it except when the child's head was in the pelvis, and then he had no doubt of its being advantageous, if the os uteri were flaccid. He considered that the ergot acted injuriously, by producing pressure upon the umbilical chord, and stopping the circulation.

Dr. L. Stewart said, in a discussion which took place in the society a year or two back, he believed it was a generally entertained opinion that the ergot acted specifically, and had no general physiological action.

Dr. Theoph. Thomson said, that the observations of American practitioners upon a large scale, confirmed the opinion that ergot was destructive of foetal life. The violent and long-continued contraction of the uterus, when influenced by ergot, might so affect the circulation of the mother as to endanger the foetus. It might be argued that the blood passed very gradually through the placenta, and that therefore this could not be the mode in which the injury was inflicted; but there was still a large quantity of the circulating fluid passing through the placenta in a given time, and it might possibly act in this way.

Mr. Proctor did not consider that the ergot acted upon the infant as a poison through the agency of the mother. He had seen a case of twins, in which the ergot was given; one child was living, the other dead. Had the ergot acted as a poison through the mother, it would have had the same effect on both children.

Dr. Stewart inquired if any member had employed the medicine under consideration in any other cases than labours.

Mr. Statham had used it in a case of chronic bronchitis without effect. It was of great benefit in menorrhagia and abortion, and much superior to acid medicines.

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*Apparatus for Vapour Baths.*<sup>1</sup>—The following is a description of a cheap and commodious apparatus for vapour baths, which was lately presented by M. Duval to the Royal Academy of Medicine:—

M. Duval's apparatus consists

1. Of a spirit-lamp, with four wick burners, which contains a decilitre of alcohol at 36 degrees. The centre of the lamp is pierced by a small opening to permit the escape of the alcoholic vapour.

2. Of a three-footed stand, composed of iron wire, and intended to support the reservoir of water. This latter contains four decilitres of water, and is closely covered in; to the cover, however, is fitted a tube through which the vapour may be conveyed to different parts of the body, and which is furnished with a cock for the purpose of stopping the vapour when necessary. When a general bath is administered the body may be enveloped in a blanket supported on hoops, and the blanket covered with oil-cloth.

The quantity of spirit contained in the lamp is sufficient to keep up combustion during fifty or sixty minutes, at a cost of about *two-pence*. The cost of the whole apparatus is not more than two pounds five shillings, while those commonly in use cost not less than from twelve to twenty pounds.—

*Bul. de l'Acad. de Méd., Nos. 19 and 20, 1839.*

<sup>1</sup> London Lancet, Oct. 12, 1839, p. 102.